

High Efficiency Exterior Lighting – Newtown Estates Community Association

Tennis and Basketball Court Lighting
Using Compact Fluorescent Lamps



Summary of Court Lighting Project

- Replace Existing 400W Metal Halide Fixtures
- Existing Lamps and Ballast Becoming High Maintenance
- Save Energy and Demand Costs
- Color Shifting and Loss of Fixture Efficiency
- Add Controls to Allow Users to Turn Courts On/Off, and With Auto Time-Out Function
- Reduce Height to Increase Safety on Maintenance

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Existing and Replacement



NECA Project Background

- Newtown Estates Community Association teamed with Energy Service Company (ESCO) to perform Survey, Phase 1, Phase 2 and Design/Build.
- 16 Energy Conservation Measures Developed, 9 Were Implemented
- Athletic Court Lighting on 2 Tennis, 2 Basketball, and 1 Volleyball, Poor High Cost Lighting.
- Very High at 30 Feet, Dangerous Operation to Change Lamps
- No Existing Controls, Employee Turned on Prior to Sunset, Often "Overran"
- Long Warmup Period, and Longer Restrike Time Meant Application of Controls Would be Annoying at Best
- Nighttime kW Peak for NECA, Big Savings and Great for HECO DSM Goals

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Project Goals

- Reduce Energy Consumption and Cost
- Lighting “at least as good as existing” FT-C
- More Uniform Foot Candle Levels (Max/Min)
- Use Lighting With Rapid Restrike (Less Than .5 Seconds) to Allow Controller
- Safer Lamp Replacement

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Project Constraints

- Paid From Savings
- Association Stagnation Problem – Management Champion
- Limited Shutdown (2 Weeks)
- High Work / Safety
- Tapered Steel Poles / Connection
- Remove Fence and Build Access
- “Don’t Touch Court Surface”
- Must Re-Use / Modify Existing Poles
- Windage
- Permit Process
- Rebate – Must be Custom Type

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Project Solution

- Pacific Energy Strategies LLC – ESCO – Design/Build
- Exterior Fluorescent – Proprietary
- Magnaray / Eco-Lite
 - Instant On Electronic Ballast
 - Variable Voltage Ballast
 - Compact Fluorescent Lamps PLL-50
- Custom Controls – Designed by PES
- Weatherproof On/Off Pushbutton – Industrial Grade
- Weatherproof Pre-shutdown Annunciator, Variable Volume, Multiple Tone Generator
- Design With Tower Design Group (Electrical PE), Same Group I Did HHSC Hospital System With

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Project Photos



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2 Court Array



Tennis Array



Custom Controls



- User Pushbuttons (Left) Allow User to Turn On/Off
- Astronomic Timeclocks and Proprietary Controls – Lights Can't Be Turned on Until Sundown, Shut off Automatically at Closing.
- Controls Provide 60 Minutes of Light (Adjustable), and Provide an Adjustable Audible Tone 5 Minutes Prior to Shutdown (Adjustable)

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Lighting "Quality"

- White Light – Very Usable by The Human Eye
- Luminous Intensity – Light is Spread Out Over 8 Feet, Unlike a Point Source
- Does Glare Out the Players
- Does Not Image on The Eye
- Not Annoying to Neighbors, Unlike High Intensity Point Source
- Does Not Shadow Like Point Source
- Minimizes "Hot Spots and Dead Spots" Improves Max / Min Ratio
- Only 20 FTC But Very Usable and Uniform
- Did We Mention "Instant On!"

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Project Results

- Customer Extremely Satisfied with Project
- Athletic Director With Big Smile “It’s Surreal”
- Preferred Nighttime Courts on “West Side”
- After 10 Months, Not a Single Lamp Out, No Problems with Controls
- Energy Savings in 60% to 65% Range

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Fixtures, Energy, and Costs

- 36 New Fixtures to Replace 44 Old Fixtures
- Base Case kW = 20.7 kW
- Retrofit kW = 7.8 kW
- Base Case kWH = 30193 kWH
- Retrofit kWH = 5929 kWH
- Net Cost \$34,600
- Annual Savings \$5,219 (2003 Rates)
 - SPB 6.62 Years
 - Note that this was a difficult retrofit
 - Tough Access
 - Retrofit Existing Tapered Poles (Aerial Welding, Machined Flanges)

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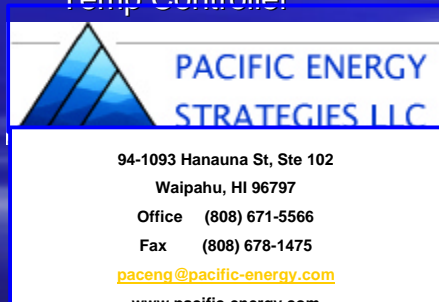
Summary

- First Project of This Sort – “Loss Leader” to Get Over Learning Curve, Custom Controls.
- “Only a Mechanical Engineer Would Try This”
- Site Visit Dec 5 – 1:00 PM to 1:30 PM – Private Association So Must Have “Invite and Escort”
- Email solsen@pacific-energy.com to RSVP for Site Visit, Office 808-671-5566
- Coffee Mugs, Photo Prints, and PPT Prints
- IESNA International Lighting Award Submission

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NECA Energy Project

- General Lighting Retrofits
- Occupancy Based Lighting Controllers
- Athletic Court Lighting and Controls
- Pumping Hydraulics and Efficiency
- Peak Shaving with LPG Heater on Spa
- Insulation Repair
- Solar System Recommission / Repipe
- Daylighting Controls – 3 Sensor Panel
- Steam Room Time and Temp Controller



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